

Remarks

Claims 1-3 and 6-38 were pending in the application. No claims have been allowed. Dependent claims 39-44 and independent claim 45 have been added. Claims 15 and 32 have been amended. Claims 4 and 5 were previously canceled without prejudice. Thus, claims 1-3 and 6-45 remain pending. Reconsideration of the application and the claims is respectfully requested in view of the foregoing amendments and following remarks.

Cited Art

U.S. Patent No. 4,581,712 to Perry et al. ("Perry") is entitled "roof pressure monitoring system."

U.S. Patent No. 4,604,706 to Fisher, Jr. et al. ("Fisher") is entitled "apparatus for failure predication of earth structures."

U.S. Patent No. 5,542,788 to Stankus et al. ("Stankus") is entitled "method and apparatus for monitoring mine roof support systems."

U.S. Patent No. 4,480,480 to Scott et al. ("Scott") is entitled "system for assessing the integrity of structural systems."

U.S. Patent No. 3,672,174 to Von Hippel ("Von Hippel") is entitled "method and apparatus for supporting the roofs in underground excavations."

Overview

Applicants point out that the references plainly lack sufficient suggestion or motivation to combine or modify the technologies to result in the claimed arrangements that recite technologies related to a "mobile roof support unit." Applicants request a telephonic Examiner interview if the Examiner disagrees after reading the below remarks.

Patentability of Claims over Perry-Von Hippel-Fisher-Stankus under § 103

The Action rejects claims 1-3, 6-8, 11-13, 15-17, and 24, and 29-38 under 35 U.S.C. § 103(a) as being unpatentable over Perry in view of Von Hippel, Fisher, and Stankus. Applicants find insufficient motivation to combine or modify the Perry and Von Hippel patents. Further, if the references were combined as described in the Action, the resulting combination

would be inoperable. Thus, Applicants respectfully submit the claims in their present amended form are allowable over the applied art.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, *either in the references themselves or in the knowledge generally available to one of ordinary skill in the art*, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2142.)

Perry and Von Hippel lack sufficient motivation or suggestion to combine or modify that would result in the recited arrangement of “alert miners of dangerous loading conditions on the support systems of the mobile roof support unit during mining operations.” Claim 1 is directed to an “apparatus for monitoring the dynamic loading rate on support systems of a mobile roof support unit used in an underground mine” and recites (emphasis added):

A plurality of sensory indicators located in the vicinity of said at least one load sensing device and controlled by said programmable controller to provide timely warning indications used as an aid in determining when to install additional support systems and *alert miners of dangerous loading conditions on the support systems of the mobile roof support unit during mining operations* on a real-time basis.

The Action agrees that Perry does not explicitly mention the “mobile roof support unit” aspect of the claim (Action at page 4). Thus, the Action relies on Von Hippel, which describes a “mobile mine roof support” at column 3, lines 41 et seq. The Action then concludes that it would have been obvious to include the teaching of Von Hippel in Perry, based on Von Hippel at the abstract and column 1 line 68 – column 2, line 35.

Motivations to combine or modify references must come from the references themselves or be within the body of knowledge in the art. (See MPEP § 2143.01.) Applicants have carefully reviewed the passages cited in Von Hippel and find no motivation to incorporate the described “mobile mine roof support” or any other technology into a system that would “alert miners of dangerous loading conditions on the support systems.” Elsewhere, Von Hippel does describe a “gauge” at column 5, lines 10 et seq. However, Von Hippel’s text does not describe and the drawings (e.g., FIG. 1) do not show that the gauge could alert miners. Also, Von Hippel describes “a novel control system which automatically responds to overstressing” at column 1,

lines 72 et seq. Again, however, Von Hippel does not describe that responding includes alerting miners. Accordingly, any mention of alerting miners of dangerous loading conditions is conspicuously absent from Von Hippel. Thus, Von Hippel plainly lacks any suggestion or motivation to combine or modify “mobile mine roof support” so that it would result in the arrangement of claim 1.

Perry fails to mention “mobile roof support unit,” and therefore also lacks any suggestion or motivation to combine or modify mobile mine roof support technology. Thus, neither reference contains sufficient motivation to combine with or modify the other. Fisher and Stankus also lack sufficient motivation to combine or modify. Accordingly, a proper prima facie case of § 103 obvious has not been made, and Applicants request that the rejection be withdrawn.

If Perry were combined with Von Hippel, the resulting combination would be inoperable. Von Hippel describes a “mobile mine roof support” that uses “hydraulic pit prop” at column 3, lines 41-45. By contrast, Perry describes a “sensor is a device which is located in the bolt pressure path in the same way as a ‘washer’ would be” at column 4, lines 36-38. Thus, even if a motivation to combine were found, Perry’s technique simply would not work with the mobile mine roof support of Von Hippel. (*See* MPEP §2143.01 – The proposed modification cannot render the prior art unsatisfactory for its intended purpose; The proposed modification cannot change the principle of operation of a reference.) Accordingly, a rejection based on such a combination is improper and should be withdrawn.

For at least these reasons, claim 1 is non-obvious under a Perry-Von Hippel-Fisher-Stankus combination. Therefore, Applicants respectfully note that claim 1 is in a condition for allowance. Claims 12, 15, and 24 recite a similar element (e.g., “mobile roof support”); thus, they too are in condition for allowance. Claims 2-3, 6-8, 11, 13, 16-17, and 29-38 depend from an independent claim. Since dependent claims incorporate the elements of the independent claims, they also are allowable.

**Patentability of Claims 9-10, 14, 18, 20, 26, and 28 over Perry-Fisher-Stankus-Scott
under § 103(a)**

In paragraph 4, the Office Action rejects claims 9-10, 14, 18, 20, 26, and 28 under 35 U.S.C. § 103(a) as being unpatentable over Perry in view of Von Hippel, Fisher, Stankus, and Scott. Applicants respectfully submit the claims in their present form are allowable over the

cited art. As described above, Perry, Von Hippel, Fisher, and Stankus in combination would not lead to the claimed arrangement involving “mobile roof support.”

Scott describes scenarios involving “structure moment detectors (SMD’s)” at various passages in its disclosure. However, Scott still lacks sufficient suggestion or motivation to combine or modify Perry or any of the other references to result in the arrangement of independent claims 1, 12, 15, or 24.

Claims 9-10, 14, 18, 20, 26, and 28 depend, directly or indirectly from claims 1, 12, 15, or 24, and therefore are also in condition for allowance and such action is earnestly solicited.

Patentability of New Dependent Claims

Applicants have amended the application to include new dependent claims which recite novel and non-obvious patentably-distinct subject matter supported by the specification as filed.

For example, claim 39 recites a sensory indicator “indicates a safe condition.” The claimed combination is not taught or suggested by the relied on art.

Further, the new claims depend from allowable claim 1. For at least these reasons, the new claims are allowable at this time.

Patentability of New Independent Claim 45

Applicants have added independent claim 45 which recites “wherein the mobile roof support unit is operable to support a mine roof during retreat pillar mining operations.” The recited feature of the mobile roof support unit is supported by the Application at page 2, line 6. The references, alone or in combination, fail to teach or suggest a mobile roof support unit “operable to support a mine roof during retreat pillar mining operations” as recited. The claim is therefore allowable at this time.

Request for Interview

If any issues remain, the Examiner is formally requested to contact the undersigned attorney prior to issuance of the next Office Action in order to arrange a telephonic interview. It is believed that a brief discussion of the merits of the present application may expedite prosecution. Applicants submit the foregoing formal Amendment so that the Examiner may fully evaluate Applicants’ position, thereby enabling the interview to be more focused.

This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

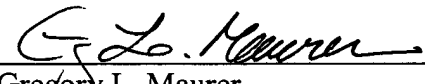
Conclusion

The claims in their present form should now be allowable. Such action is respectfully requested.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By



Gregory L. Maurer
Registration No. 43,781

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 226-7391
Facsimile: (503) 228-9446